

During the 19th century in the Dysynni Valley a drainage system was created to reclaim land for agriculture. The engineering project created embankments along the river and in effect canalising the river. On either side parcels of land require enhanced drainage. All the drainage lead into the main carrier ditch called the low-level. This system carries the drainage water through a linear ditch to the sea near the water treatment works.. Some of the drains require to pass under the Afon Dysynni using syphons and gravity instead of pumps, due to the low gradient within the valley.

The Afon Dysynni runs down the valley and is an integral function to the management of the valley water levels. The gradient from the top of the valley down to its mouth is very shallow and is shown by the amount of silt building up in the system.

The embankments create a protective barrier to the fields and flood risk protection to the villages of Tywyn and Bryncrug. To maintain the embankments we require to mow the banks 3-4 times a year. The embankmenst were constructed using the local material that include the silt material from the river that includes peat and soil. The materials are not considered ideal for banks but are adequate if maintained. A key factor of maintaining the banks is to ensure they are not under water / waterlogged fpor a prolonged period of time. If allowed to be waterlogged for a long periods the banks will start to slump that can lead to overtopping or breaches.

The Afon Dysynni flows into a wide area called the Broadwater whereby wading birds forage for food and is a SSSI. In this area the power of the river is further diminished as it travels over a shallow and wide area of land but the water flows on the right hand side along a deeper channel. If blockages are felt further down, the Broadwater is under water for longer periods restricting foraging opportunities for the wading birds.

Further down the river has been canalised until the mouth where it passes under the Network Rail Line and under a public footpath. This stretch of river has been designed not to meander to avoid the river moving and reduce the risk of the railway line moving.

At the mouth of the river lies a training wall to eliminate the mouth of the river travelling further South and prevent the river meandering. In the past the channel had been maintained, but this routine action ceased to occur. As the river is generally a slow moving along a shallow gradient any blockages that might occur can have a increase effect how much water can be released from the system.

During the year, longshore drift transports shingle material along the coast and in front of the mouth. Since the maintenance stopped on the mouth, the channel has begun to move Northwards and increases in that direction during winter storms. The end effect is the mouth is being squeezed into land and being blocked by shingle during storms and causing a backwater effect. As mentioned, the effect of water standing for longer periods causes damages to the banks and siltation to occur and minimising the carrying capacity of the channel. All the negative effect has consequences for the agricultural land and embankments that protect people and properties from flooding.

During storms in 2013 the mouth of the river had been blocked by the amount of shingle being deposited in the channel. Subsequently emergency works were carried out that has lead onto to the current licence in place (RML1657v2) The works involve using excavator to move gravel from the channel and move to a section Northwards using a dumper and an excavator to place the material. This practice has occurred for the past few years and issues have arisen from the works. These include:

- High cost of labour and plant hire (3 men and 3 plant machinery)
- Time consuming
- Short lifespan of the work due to storms closing the mouth.

The proposed method of works would involve only two machines (excavator/dozer) to carry out the works. The initial cut would take time to complete, but future maintenance would take considerably less due to the mouth being protected by the training wall. The proposed method of work aims to be a quicker, more efficient process that what is currently in place.